# A NEW THEORY

AND

# TREATMENT OF DISEASE,

FOUNDED UPON

# NATURAL PRINCIPLES.

BY

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AYR.

"As it is the part of a bad man to destroy his fellow-creatures, so it is the duty of a good man to preserve them."—SYDENHAM.

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# PREFATORY NOTE.

In a variety of diseases a change of locality is usually prescribed for the benefit of a change of air. The writer of these pages is of opinion that this object can more easily, and with greater comfort to the patient, be obtained at home. It is only a few months ago that the idea first occurred to him of administering *Oxygen*, or the vital portion of the air, either as a medicine or prophylactic. Having since then tested its efficacy in several cases, and in each with eminent success, he feels that he would not be discharging his duty either as a professional man or a philanthropist, did he not lay the following pages before the public; although he has no doubt that his theory will meet with opposition, and that it may even be regarded by many as chimerical and visionary.

Before proceeding to the illustration of the subject, he conceives it necessary, in the first

place, to give a brief description of the physiology of the human frame, accompanied with a short statement regarding the nature of disease, acquired from chemical and pathological research, since he is anxious to engage the attention of the public, as well as that of the profession.

Note.—Dr. Beddoes administered Oxygen along with other gases in various diseases nearly fifty years ago; but his theory of disease being imperfect, his success was too limited to secure permanence to the system.

Ayr,
22nd February, 1843.

# A NEW THEORY,

&c., &c.

## Firstly.—The Blood and its connection with Respiration.

The Blood is the main element of the animal creation. From it we originate, by it we are nourished, and increase in our growth, and, as chemistry shows, the ultimate structure and component parts of all the different organs, the secretions, and even the excretions, form a series of different combinations of some of its ingredients.

The Blood is in constant motion. It is propelled by the left *ventricle* of the heart, and through the medium of arteries supplies nourishment to the system; after which it is returned by the veins, in a retrograde manner, to its recipient, the right *auricle*, having collected in its course all the additions requiring oxidation. It is then conveyed from the right *auricle* into the right *ventricle*, whose contractile power forces it over the expan-

sive membrane of the air tubes and cells of the lungs to meet with the necessary aeration, it being well known that gases penetrate animal membranes. Thence it proceeds into the other recipient, the left *auricle*, and having completed its current through the system, comes back to the left *ventricle*.

The constituents of the blood are, according to Professor Liebig of Giessen:—*Fibrine*, *Albumen*, *Phosphorus*, *Sulphur*, *Bone-earth*, *Sea-salt*, and other salts of *Potash* and *Soda*, in which the acids are *Carbonic*, *Phosphoric*, and *Sulphuric*—a red colouring matter of which *Iron* forms a constant ingredient—together with some *Fatty particles*. *Fibrine*, and *Albumen*, contain *Carbon*, *Hydrogen*, and *Oxygen*, and other constituents already in the blood.

According to Professor Thomson of Glasgow:—

| | |
|---|---|
| Albumen, | Common salt, |
| Hematosin, | Chloride of potassium, |
| Yellow colouring matter, | Sal ammoniac, |
| Fibrine, | Sulphate of potash, |
| Extractive matter, | Carbonate of soda, |
| Serolin, | ———— lime, |
| Cholesterine, | ———— magnesia, |
| Cerobrote, | Phosphate of soda, |
| Iron, | ———— lime, |
| A volatile fatty acid salt, | ———— magnesia, |
| Soap or Margarie and Oleic acids, | Laetate of soda. |

The whole weight of the blood, according to Lavoisier and Séguin, is 24 lbs., of which 80 per cent. is water—Thomson says 26 lbs.—and "it completes its circulation through the system in about 3·06 minutes. Hence $8\frac{1}{2}$ lbs. of blood pass through the lungs in a minute."

*Carbon*, *Hydrogen*, and *Oxygen*, are its vital properties. The other ingredients are for the maintenance of uniformity in all the different organic structures, &c. It is at all times losing an imperceptible quantity to make up the continual waste of the human frame, but it is simultaneously receiving a corresponding increase. After fulfilling all the objects for which it is required by the bodily organs, it throws off, by different outlets, such of its ingredients as are no longer necessary. It is then returned to the lungs, where it parts with a certain amount of *Carbon* and *Hydrogen*, and receives a due proportion of *Oxygen*, at each inspiration, by which it is kept in a condition fit for supporting the constant action of waste and supply.

### Secondly.—Animal Heat.

It is a well authenticated fact that all chemical changes are accompanied by caloric (except a few unconnected with animal life); and since chemical changes are continually taking place in all parts of the body, it is easy to account for the heat of the animal frame.

The heat of persons in health being the same in all

parts of the globe (from 98° to 100°), the natural food of the inhabitants of cold arctic regions is fat, oil, &c., which abound in carbon (the great promoter of animal heat)—having from 66 to 80 per cent.—whereas fruits, which only contain about 12 per cent. of carbon, are the food of those inhabiting hot southern lands. In our own variable climate, we are furnished during one part of the year with fresh nutritious vegetables, and have not so much inclination for animal food as during the colder season of the year when such vegetables as we do use are drier, and consequently contain more carbon than when full of sap. Hence we are led to infer that heat originates in the lungs by the action of the *Oxygen* inhaled from the atmosphere upon the *Carbon* and *Hydrogen* of the blood, forming with the one *Carbonic acid*, and with the other *Water*, both of which escape by expiration. This oxygenated blood is conveyed to all parts of the body, to enable the different organs to fulfil their chemical processes, all of which must give out *insensible caloric*. Now when we consider that the glandular operations are general over the whole system, internal as well as subcutaneous, and that these, together with all the other chemical organic transformations, including the *Gastric* and *Intestinal* changes, are going on at all times, simultaneously, we cannot be surprised that the heat is the same in all parts of the body. In addition to all these sources of *caloric*, heat arises from muscular and other frictions. Hence the system

is more susceptible of cold during sleep, all parts of the body being then at rest.

Man must therefore live on food, as Liebig explains, which will supply a sufficiency of carbon, not only for the waste of the system, and the necessary growth in youth, but also fulfil the complete arterialization of the blood in the lungs, for which, according to Thomson, 16 cubic inches of air is inhaled, but only 0·6432 cubic inch of oxygen gas is absorbed by the blood—by Liebig, 1·99 cubic inch, at each inspiration.* From these statements it appears that the *Nitrogen* of the atmosphere serves the double purpose of diluting the oxygen, and also of increasing its volume, to allow at all times a portion of the membrane of the lungs to rest itself, while another portion is absorbing a sufficiency for health; the additional quantity inspired being immediately eliminated by expiration. Since so small a portion of *Oxygen* is absorbed in a healthy state, the absolute necessity of making pure oxygen for inhalation to remove disease must be obvious.

According as the temperature may be high or low, a lesser or greater quantity of oxygen will be respired in the same volume of air; and for the same reason we require a greater quantity of nutritious food in winter than in summer, to provide a larger supply of carbon, so as to keep the body at its uniform temperature.

* Upwards of a 100 cubic inches of air remain at all times latent in the lungs, for the purpose of supporting the blood, against the frequent accidents to free respiration.

Hence in a case of starvation, those parts of the body which abound most in carbon, such as fat, become absorbed, until even the brain—the stimulating power to all organic duties—is forthwith materially affected when death ensues.

The animal heat varies according to the rapidity of the circulation, or, in other words, according to the amount of oxygen consumed. In infants the heat is about 102°, and they necessarily require their food at shorter intervals, for the purpose of supplying the oxygen with the requisite carbon, to keep up that increase of heat, as well as for the nutrition and growth of the body. A man taking abundance of exercise, and exposed to the open air, inspires more oxygen, and therefore has a keener appetite, than a person of sedentary habits, confined to his room. He is in consequence less susceptible of the influence of change of weather. Another phenomenon may be adverted to. A person ascending a mountain feels a contraction about his chest, as if he could not inspire enough of air; this evidently arises from the rarity of the atmosphere, since in the same volume of air there is not the same amount of oxygen as at the bottom of the mountain. He therefore has to respire the deeper and quicker for some time.

In disease this is also true. In a paroxysm of fever we invariably find the animal heat correspond with the rapidity of respiration and circulation. The sudden stimulus of grief or joy, in many instances, causes an

instantaneous acceleration of the heart's action, a long drawn inspiration, and a sudden glow of heat over the whole surface. In others, it causes an almost immediate stop to the circulation, followed quickly by fainting, and the heat of the body gradually disperses itself to the surrounding media, not receiving during the interim its necessary supply of *Oxygen*.

### Thirdly.—Health.

Health consists in a simultaneous agreement of the *vital*, *natural*, and *animal* functions.

The vital functions are those of the blood,—its impelling power the heart—and purifying agents the lungs. The natural functions are those of digestion, secretion, and excretion. The animal functions are the due operation of our external senses, the powers of volition and locomotion, and the mental faculties. Now, that all of these functions may be kept in proper regularity, it is absolutely necessary that attention be paid to two particulars, which are in some degree under our control.

### First.—The Atmosphere.

Pure air is composed of two gaseous fluids, *Nitrogen* and *Oxygen*, in the proportion of 80 parts of the former to 20 of the latter, with a due degree of watery vapour; Thomson says that one part of carbonic acid is contained in the thousand. In towns combustion is extensively

carried on, and living creatures of various kinds are congregated together, consuming the vital principle oxygen, and eliminating carbonic acid in its stead. This acid being considerably heavier than the atmosphere, and not meeting immediately with the productions of the vegetable kingdom, or any other of its usual absorbents, necessarily takes the place of a portion, *pro tempore*, of that fifth part—*Oxygen*—the absolute vital principle of all animate beings.

Chemical or pneumatic science cannot as yet detect a difference in the air of towns from that of the country, although a change is perceptible on the constitution of every one removing from the one to the other. This is no wonder, considering the minute portion of oxygen required for the continuance of health.

Since the capacity of a healthy individual's lungs is at all times the same, and as more oxygen is necessarily required for respiration during winter than summer, it is natural to suppose that it will be carried on with more difficulty during the colder seasons. This, however, is not the case, the difference of the vivifying principle is accounted for, by the difference of density, and the absence of a considerable portion of the watery vapour of the atmosphere.

Pure air should be colourless, inodorous and tasteless; this however, is seldom the case; it is mixed with odours of various kinds.

## Second.—Food.

There are three classes of animals differing in their modes of living; the *Graminivorous*, *Carnivorous* and *Omnivorous*, to the last of which man belongs. He requires a sufficiency of nutritious food from two different sources, the vegetable and animal kingdoms, to sustain the body in a state of health. This food must be composed of the same ultimate elements as the blood, so as to undergo assimilation in the system, to form the different secretions, organic bodies, &c., for supplying the waste of all their respective functions, for supporting the animal heat, and increasing the growth and development of youth.

Liebig divides food into Nitrogenized and Non-Nitrogenized.

The Nitrogenized Food is,

Vegetable Fibrine,
——— Albumen,
——— Caseine,
Animal Flesh,
——— Blood.

The Non-Nitrogenized Food is,

| | | |
|---|---|---|
| Fat, | Pectine, | Wine, |
| Starch, | Grape Sugar, | Beer, |
| Gum, | Sugar of Milk, | Spirits, |
| Bassorine, | Cane Sugar. | |

These last are the elements of respiration which we receive in our diet.

The Azotized constituents of vegetable food have a composition identical with those of the blood. No nitrogenized compound, the composition of which differs from that of *Fibrine*, *Albumen* and *Caseine*, is capable of supporting the vital process; the blood must be supplied regularly with all the component parts of the animal frame; in order to form the different chemical transmutations of the individual parts. If this be not done, disease is gradually formed.

The Non-Nitrogenized food, when used in too great a proportion, gives origin to fat, composed of *Carbon*, *Hydrogen* and *Oxygen*.

These conditions are still more indispensable in the case of man; it being now very clearly proven, that diseases of a very serious nature originate in living exclusively on either diet.

This regulation of Divine Providence is evident from our first existence. The food of the infant is milk. whose elements are *caseine*, *sugar of milk* and *butter*. Caseine is the Nitrogenized food, and also contains more of the earth of bones than blood does, so as to form the necessary osseous deposits. The sugar of milk and butter contain the carbon and hydrogen, for the respiratory process. Albumen, Fibrine and Caseine, although different in appearance, are composed of the same proportions of organic elements. When these enter the stom-

ach, they meet with *Gastric Juice.** This begins digestion, which is assisted in its process by the *Oxygen* taken along with the food, as by saliva.†

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Having now explained, that the *blood* is the main element of the body, and the heart the propelling force of the blood:

That the *Nervous system* is the stimulus of the heart, and all other organs:

That the *Lungs* are the purifying agents of the blood:

That all the organs are nourished by that pure blood, and through its influence perform their appropriate operations, and,

That the *Animal heat* arises from the simultaneous effects of these various processes, I will lay before my readers my theory, and treatment of a disease arising from a deterioration of the blood, namely,

## SCROFULA.

This is a disease prevalent in variable climates. In general, it begins during the cold months of winter or spring, while it meets with corresponding relief during

* Food requires to be bulky, so that the digestive organs may act with uniformity, and the portions of their absorbing surface may be allowed alternately to rest.

† This article on food is chiefly extracted from Liebig's Organic Chemistry.

the steady genial warmth of summer. It generally shows itself before the age of puberty. The predisposition to it is conveyed by hereditary influence. The disease is excited, and may even be caused *sui generis*, by bad air, insufficient nourishing diet, neglect of personal cleanliness, salutary exercise, and comfortable clothing; or by damp, and deficiently ventilated dwellings.

It is not contagious. It shows itself most frequently in the glandular system, but also attacks the joints, bones, lungs, &c. Those predisposed to the inroads of this disease are characterised by a peculiar laxity and softness in their appearance.

The direct cause of this disease is a deposition of some of the primary elements of the blood. The chief of these is *Carbon*, which may arise from a continued respiration of a deteriorated atmosphere. That atmosphere not being sufficient to supply *Oxygen* to the proper degree of *Carbon* for the arterialization of the blood, *Carbon* gradually becomes deposited in the lungs or in some portion of the *Glandular system.* The *Glands* being supported by this insufficiently oxygenated blood, gradually become unable to perform their own functions, and *Carbon* is therefore deposited in their minute structure. As the glands of the neck do not obtain protection equal to those of the other parts of the body from the vicissitudes of the weather, they in general first suffer from this disease.

The same result arises from insufficient diet, or from a diet sufficient in quantity but not in nourishing pro-

perties. I refer to vegetables, which are so generally made use of in this country by the poorer and working classes who are unable to procure animal food. Vegetables abound in carbon, and as only a limited portion of carbon is required for the natural respiratory process, it necessarily accumulates in the glands in the manner already described. This the more readily occurs, when vegetable diet is combined with impure air, as too generally happens to the working classes of society.

Among the affluent, this disease arises from the many varieties of food consumed at one repast, and other common irregularities in youth, which tend to derange the proper nutriment of the *vital fluid*. The due regularity of food is of very material consequence; the blood having during youth two grand objects to perform, the support of the body, and its uniform increase of growth.

The predisposition to Scrofula is not uncommon in rural life, where the people, although they receive abundance of food, exercise, and pure air, live too exclusively on vegetables—the produce of their own labour. This I am credibly informed was much more the case in former days than at present. They are distant from markets, constantly employed, and being brought up in this mode of living, they have no idea that it ultimately proves injurious to health. However, they in general look healthy and fat, rather than otherwise, but, (fat being a non-azotized principle, composed of *Carbon*, *Hydrogen*, and *Oxygen*), when they remove into the confined

employments of large populous towns, the effects of the change of air are often speedily exemplified by *tubercular deposition* taking place not unfrequently on the lungs.

Together with all these predisposing causes, *tubercular deposition* is the more readily excited by the impossibility of preparing oneself to meet the various atmospheric changes that daily occur.

This deposition having once originated, continues to increase, until it has formed clusters of tubercular glands, in different parts of the body. So soon as one or more of these glands are rendered unfit for the performance of their duties the others necessarily have an increase of labour, and while the same exciting cause exists, depositions are induced the more until they arrive at, and assume the various conditions and shades of aggravation, which the persons of those unfortunate victims of its dreadful ravages exemplify.*

In whatever class of society it does exist—the individuals are not constantly under the baneful influence of its exciting causes. I account for the frequent intermissions of aggravation and relief in this way. The elements of those tubercles not being foreign to the system, the tendency to suppuration is slowly induced. Hence the comparatively painless manner in which they enlarge and form abscesses.

* Tubercles are found to consist of Carbon, Hydrogen, and (perhaps) Nitrogen, therefore even although this theory of their production might admit of doubt, yet it cannot influence in the slightest degree the necessity of the method of treatment which I have adopted.

Of all the infirmities which afflict the human race, scrofula is undoubtedly one of the most tedious and difficult to cure, if ever a cure has been performed, otherwise than by the process of nature.

A considerable impression must be made upon the system generally, before this strumous condition can be destroyed. It frequently loses its intensity, and occasionally becomes completely effaced under the influence of those changes, brought about at certain critical periods of life; but the ravages of this disease so common to our climate, are unquestionably increasing in frequency, if not in intensity.

Now, as Logul says, "it must always be borne in mind, that even when we are successful in curing any local manifestation of Scrofula, unless we can get rid of the disease under the influence of which the local malady appeared, little has been done towards restoring the patient to health."

That influence of disease can now be removed simply by the

## INHALATION OF OXYGEN.

This will convert, by direct agency, the *Tubercles* into *Carbonic Acid Gas*, and *Water*, (the nitrogen of them if any will then be eliminated), all of which are natural emanations from the system.

This treatment is so simple, and so much in accord-

ance with the rules of nature, that it must commend itself as worthy to be adopted in medical practice.

The oxygen is an important element of the water we drink, of the food we eat, and the *sole vital portion* of the air we breathe. Why not conceive, therefore, that any diminution of its due proportion may occasion disease, and that the restoration of that proportion may effect a cure?

## PULMONARY CONSUMPTION.

In this disease—which is simply Scrofula of the lungs—whether hereditary or otherwise, oxygen must prove to be of vital importance. As the lungs in ordinary respiration necessarily keep the upper lobes more in active exercise than the lower, the former first take on tubercular disease—which gradually extends: the healthy portions having their own duty to perform, as well as that of the parts diseased, in order to acquire the necessary oxygen from the atmosphere.

In this case, I would add to the atmosphere of the patient's room a sufficient quantity of oxygen, for the double purpose of enabling the lungs to inhale as much at each inspiration as when sound, and to act upon the tubercles, so as to reduce and remove them.

Even when those tubercles have formed abscesses (vomicæ), and emptied themselves, the tubercles and their cause being removed, the abscesses will of course *cicatrize*.

In more serious and hopeless cases, by means of this treatment, together with a well regulated Summer temperature, and a necessary supply of watery vapour in the atmosphere of the patient's room, and other judicious comforts, life will be extended to a longer period than it would otherwise have been. The salubrious air of Madeira does not remove tubercles, but being temperate and steady, it wards them off in the case of those persons predisposed to pulmonary complaints. When once they become deposited, it will at most only stay their progress, as it possesses no more oxygen than health requires; hence the necessity for an additional quantity of oxygen in this disease.

This treatment is of no less importance in congestion of the lungs, asthma, or in any disease which depends on an impediment to respiration.

## FEVERS.

Fever is a disease of the functions, (all are deranged under its influence), and has no defined morbid seat. As the *respiration*, *circulation*, and *animal heat*, are alike increased, the seat of Fever must be in the blood. The quick circulation hurries the blood to the lungs in order to be purified, by which means the breathing is necessarily accelerated, so as to take in an additional quantity of oxygen. More chemical actions taking place, the animal heat is of course increased, and the other symptoms of Fever then follow.

It is evident, therefore, in all Fevers that even increased respiration cannot supply the requisite oxygen until the frame has become emaciated; or until the body is reduced so much that the atmosphere is adequate, not only to change the *Carbon* of the blood into *Carbonic acid gas*, but its *Hydrogen* also into *Water*. Then a favourable crisis ensues, the healthy moist condition returns to the system, and the functional excitement ceases.

What can be more simple, therefore, than oxidizing the air of fever-wards in all cases of low Fever, to restore convalescence, and prevent the waste of the living frame, and often the death of the patient? A favourable issue will also be promoted by oxygenated water for allaying the parching thirst.

The efficacy of oxygen cannot be doubted in any case in which the breathing is accelerated, nor in cutaneous or other diseases depending on a deterioration or debility of the blood, chronic ulcers, cancers, &c., as they are simply different modes and appearances of the same malady. Nay, it may safely be affirmed, that if Hydrophobia, or the deadly effects of the bites of poisonous reptiles, will admit of a cure, that cure is oxygen.*

In Indigestion, Hypochondriasis, or in debility from any cause, its utility as a tonic, cannot be equalled, as it directly restores healthy vigour to the digestive organs, and its virtues as a Prophylactic are unprecedented.†

* It would be advisable to try the efficacy of Oxygen on a dog or any other animal in a rabid state, as early as an opportunity offers.

† Oxygen, when formerly administered by Mr. Watt, was found to

These are the *Non-oxidized diseases*, or the diseases requiring *Oxygen*.

I shall now say a few words on the other class, the *Oxidized diseases*, or those occasioned by a superabundance of *Oxygen*, namely,

## ACUTE INFLAMMATORY DISEASES.*

In these diseases, the hard, bounding, full pulse indicates, that the blood is forced to the lungs with increased vigour. It is evident, therefore, that as the respiration is not proportionally quickened, the blood does not require additional *Oxygen*. As *Carbon* has a greater affinity for *Oxygen*, than *Oxygen* has for *Hydrogen*, *Carbon* necessarily takes all the inspired *Oxygen*, hence the burning dry heat, and want of moisture in the system, succeeds. This condition continues until either by the lancet, or otherwise, the blood is reduced so far that a greater quantity cannot proceed to the lungs than is proportioned to the amount of *Oxygen*, which the patient inhales from the atmosphere. This oxygen being sufficient not only to change its *Carbon* into *Carbonic acid*, but also its *Hydrogen* into *Water*, convalescence immediately ensues. If the lancet and other evacuants do not prove effectual, *Carbon* also accumulates in the system,

produce fever. This quite agrees with my theory. Its superabundance, when general in the circulation, produces Inflammatory fever.

* An accelerated pulse, arising from valvular or other malformations of the heart, is the natural circulation in such cases, and should not be interfered with, by administering oxygen, unless required for another purpose.

forming a mixed case of *Typhoid Fever* with inflammation, or, a *Carbo-oxidized* disease which terminates in mortification of a part of the system and (if that part be a *vital organ*) in death.

The treatment to be adopted in *oxidized diseases* is the inhalation of *Hydrogen*, mixed with the atmospheric air, so proportioned as to form *Water* with its *Oxygen*, or two parts by volume of hydrogen with five of air. This restores a favourable crisis, by converting the superabundant *Oxygen* into *Water*.

A carbo-oxidized disease should be treated in a similar manner, but with a large proportion of oxygen, in the ratio of two volumes *Hydrogen* to one of *Oxygen*, so as to have the two-fold effect of eliminating *Carbonic acid gas* and *Water*.

AN

# OXIDATED ATMOSPHERE,

PROVED TO BE EXISTING

IN

# NATURE.

"There is no new thing under the sun."—THE PREACHER.

AN

# OXIDATED ATMOSPHERE.

To prove satisfactorily that this *oxidated atmosphere* is existing in nature, it is only necessary to peruse the following quotations.

John Purdy, Hydrographer, says: "On the Gold Coast, as well as the windward coast, of Africa, an easterly wind, called the *Harmattan*, prevails during the months of December, January, and February. This wind comes on indiscriminately, at any hour of the day; at any time of the tide; at any period of the moon, and continues sometimes only a day or two, sometimes five or six days; and it has been known to last fifteen or sixteen days. There are generally three or four returns of it in every season: it blows with a moderate force, not quite so strong as the sea-breeze, which every day sets in, during the fair season, from the W., W.S.W., and S.W.; but somewhat stronger than the land-wind, at night, from the N. and N.N.W."

In the Philosophical Transactions, vol. 71, for the year 1781, an account of the *Harmattan* is given by Matthew Dobson, M.D., F.R.S., from the inquiries

and observations of Mr. Norris, of which the following is the substance:—

"On that part of the coast of Africa, which lies between Cape Verde, and Cape Lopez, a singular periodical easterly wind, named, by the natives, the *Harmattan*, prevails during the months of December, January, and February, between Cape Verde, and Cape Lopez, the latter being to the southward of the line. At the Isles de Loss, which lie to the northward of Sierra Leon, this wind blows from the S.S.E.; on the Gold Coast from the N.E.; and at Cape Lopez, and the river Gaboon, from the N.N.E.

"The Harmattan comes on as above described. A fog or haze always accompanies it, and the gloom is sometimes so great as to render near objects obscure. The sun is thus concealed the greatest part of the day, and appears only a few hours about noon, and then of a mild red colour. At two or three miles from shore, the fog is not so thick as on the beach: and at four or five leagues distance it is entirely lost, though the Harmattan is felt for ten or twelve leagues, and blows fresh enough to alter the course of the current.

"Extreme dryness is a property of this wind. No dew falls during its continuance, nor is there the least appearance of moisture in the atmosphere. All vegetables are much injured, and many destroyed. The seams in the sides and decks of ships become very leaky, though the planks are two or three inches thick. Iron-bound

casks require the hoops to be frequently driven tighter. The Harmattan has, likewise, very disagreeable effects on the skin, lips, and nose, which become sore.

"This wind, though so prejudicial to vegetable life, is highly conducive to health; so that fluxes, fevers, small-pox, &c., generally disappear in spite of the doctor; and it contributes to the cure of ulcers and cutaneous eruptions. The baneful effects which have been said to arise from the prevalence of this wind, proceed from the periodical rains, which fall in March, April, &c., and are ushered in by the tornadoes from the N.E., and E.N.E., accompanied with violent thunder and lightning, and very heavy showers. The earth drenched by these showers, and acted upon by an intense solar heat, so soon as the storm is over, sends forth such noisome vapours, as are the occasion of putrid fevers, and other diseases."

Smith, in his Panorama, says:—

"The *Harmattan* is a wind which blows from the interior of Africa, towards the Atlantic ocean, which affects the human body, so that if it continues four or five days, the scarf skin peels off, and though the air is cool, it excites a troublesome sensation of pricking heat. Notwithstanding these effects, this wind is salubrious, stopping infection, and removing the virulence of distemper, with an efficacy not less remarkable than its other qualities."

From Cook's Geography:—

"The Harmattan is a parching dry wind attended with a smoky haze, through which the sun is discerned as a dull red body; this wind is reputed as exceedingly healthful to Europeans, whose relaxed solids are braced by its powers, and their spirits surprisingly revived by the facility which it affords to respiration, while the natives complain that it chops their lips, and frequently afflicts them with a soreness in their eyes.

"When the grass is supposed to be sufficiently withered it is set on fire by the negroes, which, in the dead of night, illumines the air with astonishing lines of flame, and seems as if the country was wrapped in one devouring blaze."

Dr. Elliotson, says in his Lectures, that,

"Small-pox is stopped by the wind called *Harmattan*, which also arrests the plague; and, what is curious, this wind will prevent persons from taking the small-pox, even if they be inoculated. When that wind prevails, inoculation is commonly found to be fruitless."

Burckhardt notes in his travels, that,

"It is a curious fact, which has been attested to me by many persons, that the small- pox has never been known to visit the Wady-Kenous, or the narrow shore from the Cataract, up to Korosko. This disease is well known at Derr, (adjacent) where it is much dreaded."

The appearances ascribed to the Harmattan in the above quotations, are precisely similar to those which

would attend Oxygen made from nitre, and not collected through water. Its extreme dryness causes the deleterious effects experienced during its prevalence. The atmosphere not being heated by the transit of the sun's rays, the earth and water do not receive their usual supply of caloric. The Harmattan is therefore a cool wind, and for the same reason no dew falls during its continuance.

The *Nitre beds*, mentioned by BURCKHARDT in his African travels, judging from the length of Wady-Kenous, cannot be less than sixty miles in extent from north to south; and, I am led to believe from other circumstances, that they extend three hundred miles from east to west. That the Harmattan is caused by these nitre beds, appears to me beyond a doubt.

I am strongly of opinion that Cubic Pyrites exists under these beds, in which opinion I am supported by many striking circumstances. The burning heat of this Pyrites drives off oxygen from the stratum of Nitre in considerable quantities during the dry weather of December, January, and February. This oxygen is attracted from an east, inclining to a northerly direction (being north of the Equator and within the limits of the trade-winds) until it falls in with those blowing from the north-east, whose course it afterwards follows. The Wady-kenous being adjacent and bearing east, slightly northerly, from these Nitre beds, is almost continually under the influence of oxygen;—not yet having received the

full impression of the sun's attraction, after its apparently voleanic evolution.

Professor THOMSON says, that "Oxygen mixed with the atmosphere in any plaee would be seattered through the air at the rate of 1142 feet per seeond; at the distance of one mile from its source, it would no longer be perceptable."

This, however, eannot be the ease within the tropics, where the attraction is all in one direetion.

It appears that after the inundation of the Nile, which is at its height about the end of September, the Pyrites beeomes so hot as to drive off oxygen from the nitre—gradually, as evaporation goes on, increasing in heat, until sulphurous acid gas eseapes, which, uniting with free oxygen, beeomes sulphurie acid. The sulphurie acid combining with Potassa of the Nitre, eliminates the purple fumes of Nitrous Acid gas, and forms the Simoom of the Desert.*

The *Harmattan*, as COOK says, exhilerates the spirits, facilitates respiration, and supports combustion in a very vivid manner. This must be *Oxygen*—since nothing else in existenee is capable of producing these effects.

The defieieney of *Oxygen* in the atmosphere of any loeality, or, from individuals at partieular times not being enabled to absorb a suffieieney of it in ordinary breathings, to support nature, is a great eause of disease. I

* Some individuals may imagine that the Nitre Beds would beeome exhausted by this natural process, but, it is quite possible that the original cause of its formation still continues to exist.

sincerely hope, therefore, that interest will be taken in this discovery, so as to promote the circulation of oxygen through public and private buildings, in such a manner, that when required, it might be allowed to escape at will. By its adoption thousands will arrive at the grand climacteric era, who under the present system may be carried by the ravages of consumption, contagious diseases, &c., to a premature grave.

Death, at this stage of existence, is thus beautifully described by Dr. J. Johnson in his Economy of Health.

"Death, from the climacteric malady, is generally easy, and often sudden at last. It is as nearly as possible the death of nature, which is always easy, antedated indeed, a few years as to time, and considerably abridged as to duration. There is here no violent struggle between a sound constitution and an accidental illness. It is like the crumbling down, stone after stone, of an ancient castle, compared with the demolition of the same edifice, at an earlier period, by catapultæ or cannon. As the mantling ivy procrastinates the fate of the tottering tower, so change of air and scene, with the mildest restoratives, will sometimes prolong the existence of the drooping human fabric, and add a zest to the cup of enjoyment till the bowl of life is drained."

I was gratified in reading the following passage a few days ago in a letter of Dr. Prior's to Sir William Burnett, published in the Edinburgh Medical and Surgical Journal for October last. In treating of fevers in Batavia, he says,—

"Although more than thirty years have elapsed since the foregoing passage was written, and above twenty since it was published, the subject of atmospheric phenomena, as the primary cause of disease in the locality there mentioned, or in others, remains nearly as it was. Analysis in the most competent hands has failed to detect those minute variations in the air we breathe, which, nevertheless, unquestionably exist, as we feel by their obvious influence on the human frame, nor shall we probably be better informed until the science of pneumatics makes many strides in advance of its present state, by the possession of finer instruments, or more delicate tests, for that purpose, than we at present possess, or until some fortunate discovery more fully unveils to the diligent inquirer that still obscure department of natural knowledge. Then, and perhaps not till then, we may probably be more successful in diminishing the excess of disease, by knowing more precisely from what it proceeds."

In conclusion, let me observe, that the apparatus with which I have, until now, been proceeding, is exceedingly imperfect. Notwithstanding this, however, I have performed many cures, no less extraordinary than interesting. I have at present above thirty patients to whom I have prescribed the inhalation of oxygen. These are more than I can well supply, until my system is extended, when I hope not only to be the better enabled to supply

them efficiently, but also to undertake the cure of many invalids whom I have reluctantly been foreed to disappoint.*

I would gladly have drawn out a list of the individuals whom I have cured, and laid them before the public, were it not that I have many scrofula patients, who, although entirely cured of the disease, require some more oxygen to remove the scorbutic appearance of, or rather to renew, the skin. I would have delayed publishing this work until I had done so, were it not that I find it rather inconvenient to be at the sole expense of providing gas, gratuitously, to so many poor individuals. I am situated differently from many other professional men, who, having hospitals under their care, would be empowered to provide it at the public expense, for the public welfare.

At a future period, I shall be happy to publish a detailed account of my cures.

* It is to be hoped that practical chemists will, ere long, devise some simple and economical method by which Oxygen may be obtained from water, and its absolute purity guaranteed.

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